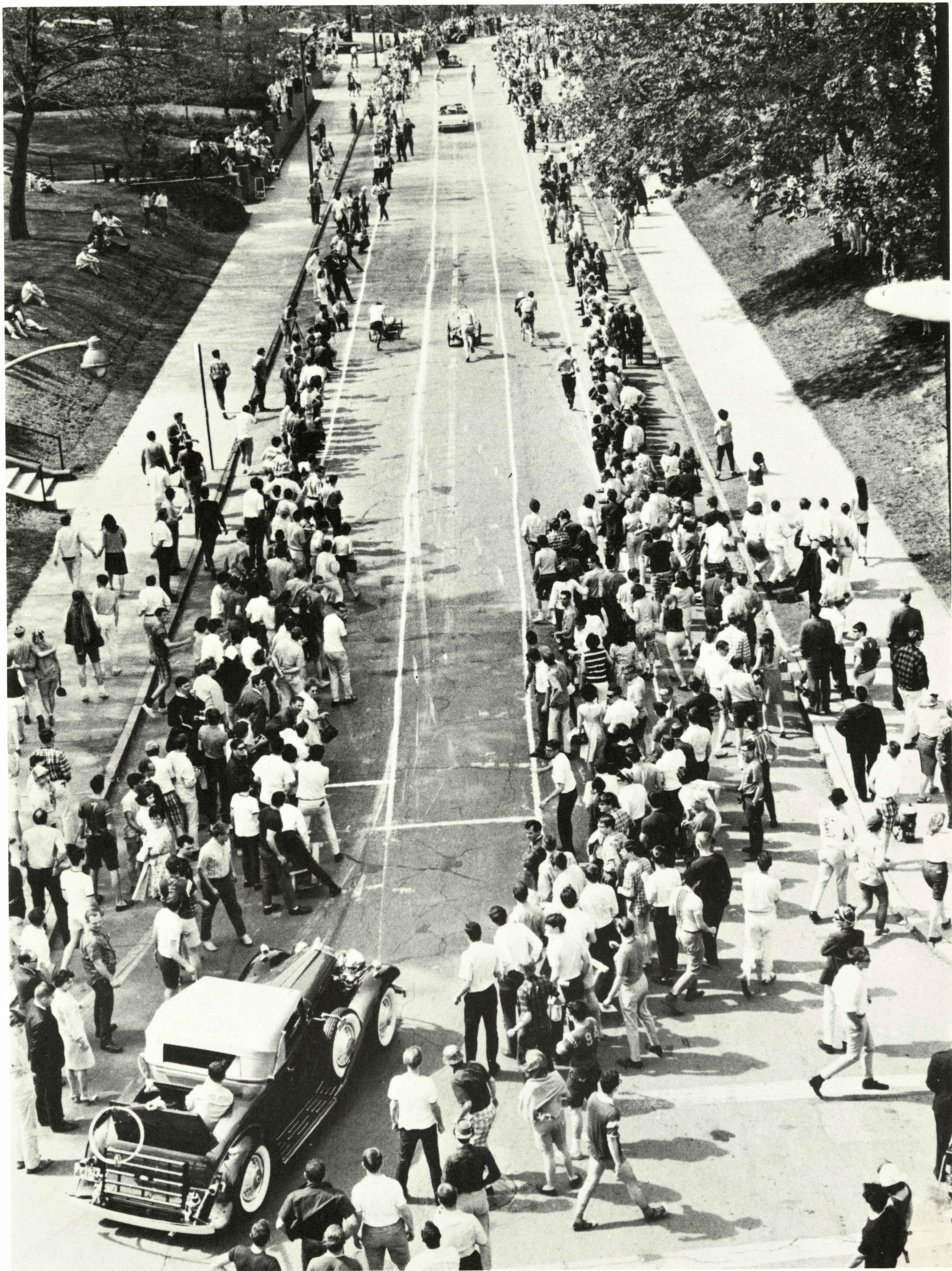




BUGGY
1967



Grand Prix of Tech

Buggies are used once a year, for the Spring Carnival celebration at Carnegie Tech. Like many other schools, Carnegie's welcoming of spring includes the selection of a queen, a booth competition, and a dance. But unlike most other schools, Tech has a Sweepstakes Pushmobile Competition, or "a race for buggies." Each Spring Carnival since 1920, except for a short pause during the war, has seen at least a dozen buggies pass the starting line. In the 1920's, box-like buggies began at Fine Arts, and finished there more than four minutes later. Today's times of two minutes thirty seconds indicate both a change in course, and greater sophistication in style.

A buggy is a vehicle not more than fifteen feet long, nor five feet wide, with a capacity for one driver. It is powered by one man pushing. Beyond these minimal requirements, it can vary greatly in design. The buggy is built close to the ground to attain high free roll speeds. The driver conforms to this design by lying prone or on his back. Four wheels are usually used, but some have three. More recently, two-wheelers have appeared. Soap-box derby wheels, or some modification thereof are in widest use; bearings are often specially treated, either with a lubricant or heat or both. Suspension also plays an important part in free roll, and it receives much attention. While some have single-rod rigid axles on solid rubber mounts, others have sophisticated systems with radius arms and hydraulic shock absorbers. Brakes are required, and consist of anything from bicycle calipers to automotive type discs and drums. The frame itself is often tubular aluminum or steel covered with a body of aluminum, fiberglass, or even papier maché. Whether bicycle-like, or a low, sleek fiberglass form, it is still a "buggy."

Each entry in the present race consists of a team: buggy, driver, and five pushers. The race is comprised of two parts: pushing and free-roll. Since about half the course is uphill, the pushers job is crucial. The ordeal begins on hill one, from the bottom to the top of Tech Street. The first pusher starts the buggy rolling and pushes it to the top of the hill, where a fresh runner takes over. The second runner decides when to let go and allow the buggy to begin its free-roll.

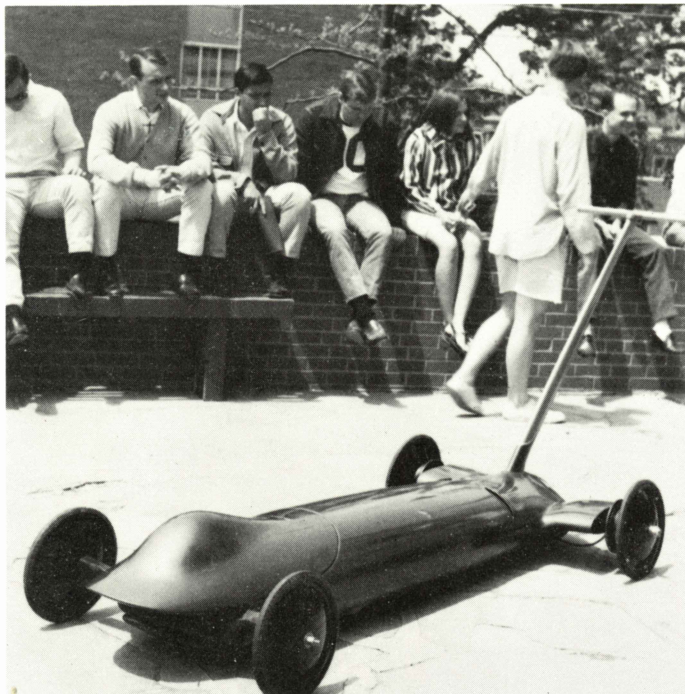
From the top of Schenley Drive to the bottom of Frew Street, the buggies roll free. The heavier, low lying buggies have an advantage over the lighter bicycles because they roll faster. Here the driver works hardest. Speeds during the free roll often approach forty miles per hour or more, and to prevent a spin the driver must turn at just the correct point. Because of poor visibility, drivers in low buggies are forced to count trees or some such thing to determine when to begin their turn. Occasionally drivers miscalculate and spin, forcing designers to look for new suspension or frame concepts, or new drivers.

If the buggy reaches the bottom of Frew Street without incident, another pusher begins the final stretch. Hills four and five, from Baker Hall to the finish in front of GSIA are the final test. Since this is the last section, any time lost must be regained on these two pusher efforts. Differences in buggy weights become very apparent as the light bicycles can be pushed much faster than the conventional low buggies. It all adds up to the last hill being the most thrilling and decisive part of the race.

But the excitement on hill five is much more than a single weekend's effort. Preparation for the race begins before the end of winter in the various "buggy rooms" on campus. Buggy chairmen begin to test new possibilities such as different bearing and suspension combinations, heating bearings, steering and suspension combinations, and, inevitably, numerous ideas are discarded. To test new concepts, and to give drivers practice, free roll practices are held early Sunday mornings for four or five weeks prior to the race. The pushers, who began working out before the last snow melted, also have an opportunity to practice. What does not work well one week can hopefully be corrected for the next week's practice.

On the fifth and sixth of May, twenty buggies, some with over \$2000 invested in them, will vie for the Sweepstakes Championship. More than one will have the combination of design, driver, and push team to lead them to victory, but only one will have the luck.

Alpha Tau Omega



This year the ATO's will run the "Golden Goose" along with a new entry that is presently nameless. The Goose first ran in 1955 as a B buggy with the Andy 1. The Andy 1 broke the course record that year by finishing in 2:25.0. The following year the Goose ran as the first buggy and tied the record. The design of the Goose was based upon the aerodynamic features of the teardrop. The addition of air scoops in 1959 further improved the performance of the record holding buggy. These scoops are designed to create turbulent flow over the rear of the buggy at speeds greater than 32 miles per hour. In spite of a rumored fifth wheel, the Goose uses only four soap-box derby wheels on the body that has an overall length of 75 inches and a height of 20 inches. These dimensions are facilitated by the driver assuming a prone position in the buggy.

The new buggy incorporates all the design features of the Goose, plus long overdue safety features. The buggy has inside padding, safety straps, greater visibility, and more efficient brakes. The ATO's have also changed the wheel base to facilitate greater maneuverability.

They have all of their A-team pushers back from last year, and hope to equal the 11 year record held by the Goose.

2 buggies entered.

Golden length - 75"

Goose: height - 20"

wheels, number and type - 4 soap-box derby wheels

suspension - rubber bushings around rear axle, tennis ball front suspension

brakes - drum

body - teardrop fiberglass shell

driver position - prone

New Buggy: same feature features as the Golden Goose with various improvements



Beta Sigma Rho

The Beta Sigma Rho "Dolphin's" tragic finish last year, preceded by a record-breaking free roll, adds more hope for a fine race this year. The unique three wheeled design has been improved upon so that the "Dolphin" can take the turns at the tremendous speeds that it attains. After three years of racing, the "Dolphin's" only finish was last year, on a bent axle and stripped tires.

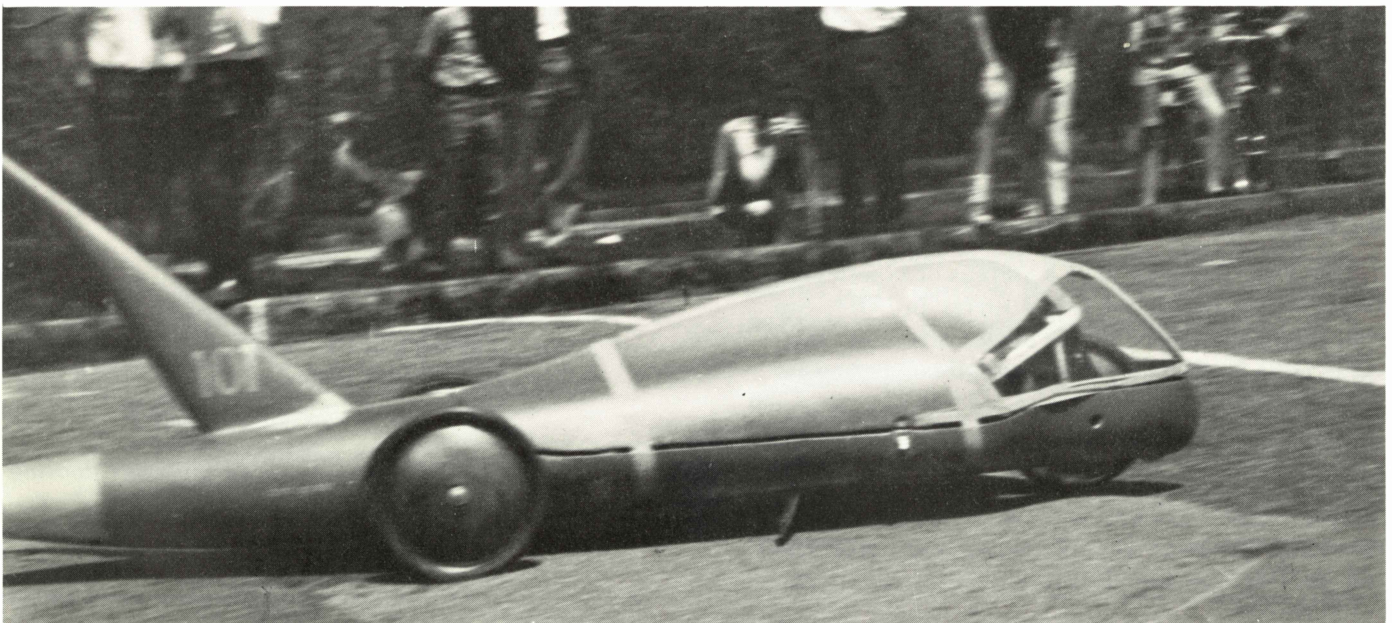
Beta Sigma Rho has been hampered by many problems and many years of tradition. Judges have stopped watches in mid-race, push bars have come off, and the buggy has spun out. The "Dolphin" has a long line of crew members who have revamped and improved it, including this year's crew led by Dennis McEvoy, Steve Friedman, and Julien Hofberg.

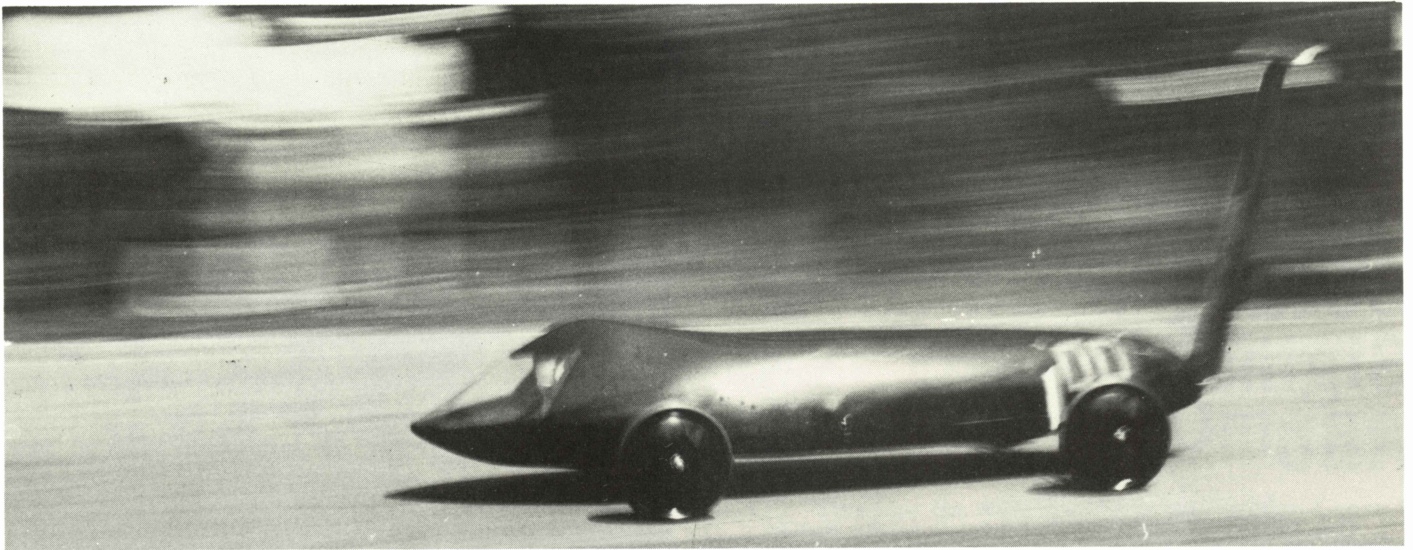
Beta Sig has been so pleased with the radical design of their buggy, that they have started con-

struction on a new improved model. This "B" buggy will follow in the three-wheeled tradition, but will have a lighter and more radical frame and body. If ready by May 5, this buggy may revolutionize the race.

Adding to the strength of their fine buggies, Beta Sig has a veteran buggy team returning. Bob "Speedy" Serabin, a veteran of two years, will again drive the "Dolphin." A young protégé, Al Siegal, possibly the smallest driver on campus, is the probable driver of the "B" buggy. The house expects a fine push team with four of last year's starting pushers, a strong secondary, and an enthusiastic pledge class.

*Dolphin: wheels, number and type - 3 soap-box derby wheels
suspension - none
frame - steel tubing and modified bicycle parts
brakes - caliper
body - fiberglass shell
driver position - prone behind front wheel*





Beta Theta Pi has been at the top of buggy racing at Tech for the last three years. Last year "00" took first in the race with a time of 2:27.84 while "000" finished sixth. Also, "00" placed first in the design competition edging Sigma Nu for the second consecutive year. Fred Riedel, this year's buggy chairman, feels that he must improve on some aspect of last year's design to remain on top in the design competition.

The "00" consists of a flat honeycomb of aluminum and cardboard to which the mechanism is attached. The driver lies prone, steering with his hands at his sides. The shell is molded fiberglass in two halves which clamp together. The most interesting feature of this buggy is its braking system. It is powered by compressed air with free floating cylinders, and like all true air brakes it emits a loud hissing sound when the brakes are released.

Assistant buggy chairman, Lon Montgomery, and Riedel have corrected the cause for "000" slow free roll time last year. They feel that with a few design changes, in addition to the fiberglass shell added last year, "000" can be a real challenger this year.

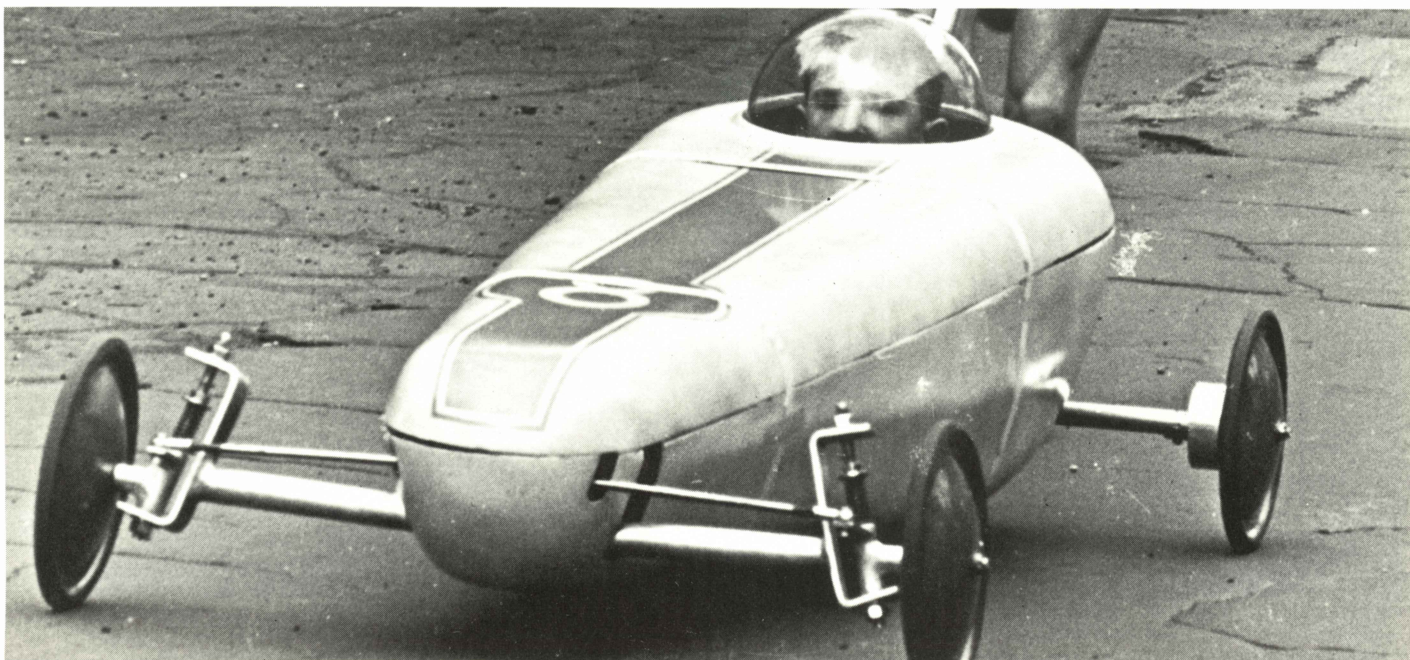
This year Beta will have a surplus of experienced drivers. Steve Peck, last year's driver in "00", Stu Berni, driver of "000", Tom Farkas, driver of "000" in 1965, and few small pledges are all competing for the two spots.

As in the past, Beta will have another strong push team. Don Keefer, Ray Burdett, Bob Livengood, Mike Kalish, Dale Klein, and Barry Hummel are all experienced pushers. The remaining four positions could be filled by Ken Happach, Jeff Sheldon, and several pledges.

Beta Theta Pi

2 buggies entered.

- 00: *length - 72"*
 height - 24"
 wheels, number and type - 4 soap-box
 derby wheels
 suspension - none
 frame - aluminum and cardboard honey-
 comb
 brakes - compressed air with free floating
 cylinders (air tank in rear axle)
 body - molded fiberglass shell
 driver position - prone
- 000: *same as 00 except for tube steel frame*



Delta Tau Delta

2 buggies entered.

- 8: *length - 78"*
 height - 24"
 weight - 100 lb.
 wheels, number and type - 4 soap-box
 derby wheels
 suspension - none
 frame - aluminum tube
 brakes - hydraulic discs
 body - fiberglass
 driver position - lying on back
- B: *length - 78"*
 height - 24"
 weight - 100 lb.
 wheels, number and type - 4 wheels soap-
 box derby type
 suspension - none
 frame - tubular steel
 body - paper maché
 driver position - prone

The construction of Number 38 (formerly Number 8) was begun in 1962 and finished in time for the 1963 Sweepstakes. The buggy was designed by Henry Rianhard, Dan Elmore and Dave Royer.

The frame is made of aluminum tubing and is six and one half feet long. For its first three races a fiberglass shell was used, but last year it was replaced by a lighter cheesecloth and shellac covering. This year it will probably run with a new light shell.

The buggy has a kingpin type suspension on the front wheels which eliminates alignment problems. The rear wheels have a suspension that is built into the frame. The buggy is equipped with hydraulic brakes that consist of two cylinders and retarding discs.

The Delts plan on entering a second buggy this year to give actual race experience to more pushers in preparation for next year when the buggy, now in the final stages of planning, will make its maiden run. The second buggy was built in 1952 and has a second place finish to its credit. Several changes will be made on it to lighten the pushing load.

The buggy chairmen this year is Paul Adler, who has been assisted by Andy Teed, Tom Handler and Mark Moore in making minor improvements on both buggies.

The push team will be lead by Tom Burgess, Wayne Hunt and Bernie Flynn. The other spots will be filled by sophomores and members of their enthusiastic pledge class.

Delta Upsilon

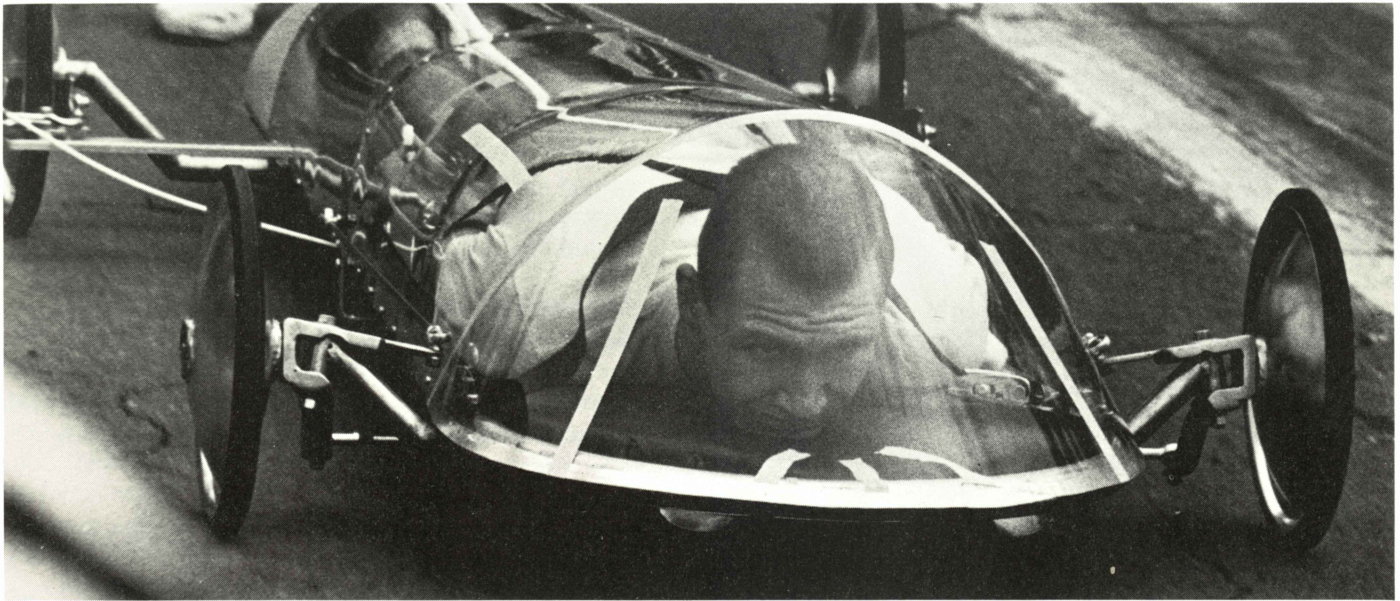
D.U.'s buggy is a very radical departure from the past year's racing machines. Initial work on the buggy was begun during the summer months and many of the design problems were solved by the time September classes had begun.

This year's entry weighs in at a mere 95 pounds, making it one of the lighter buggies on campus. The machine is 95 inches long and the measurement to the top of the pushbar is 45 inches. The driver lies in a prone position in the four-wheeled vehicle. The lightness of the chassis was achieved through the use of aluminum components wherever possible. The internal expanding brakes were improved upon and a new set of brake drums were constructed. The buggy has a much improved steering mechanism and features a dropped front axle to enhance the driver's vision. D.U. hopes to have a stronger push team this year and is out practicing under Push Chairman John Polles. The house has several fast pushers, including Jay Brenner, Kem Phillips, Howard Illian, and Hill 1 man, James T. Cordy.

1 buggy entered.

---: *length - 95"*
height - 45"
weight - 95 lb.
wheels, number and type - 4 soap-box
derby wheels
suspension - none
frame - tubular aluminum
brakes - spring loaded friction device
body - plywood sheeting
driver position - prone





Dormitory

This year dormitory efforts are being concentrated on streamlining the present A and B buggies in order to improve free roll. Despite last year's excellent push team, the nearly vertical front of the A buggy caused sufficient air resistance to remove the vehicle from serious contention. This year's A buggy will get a fiberglass shell enclosing both the driver and the front wheels.

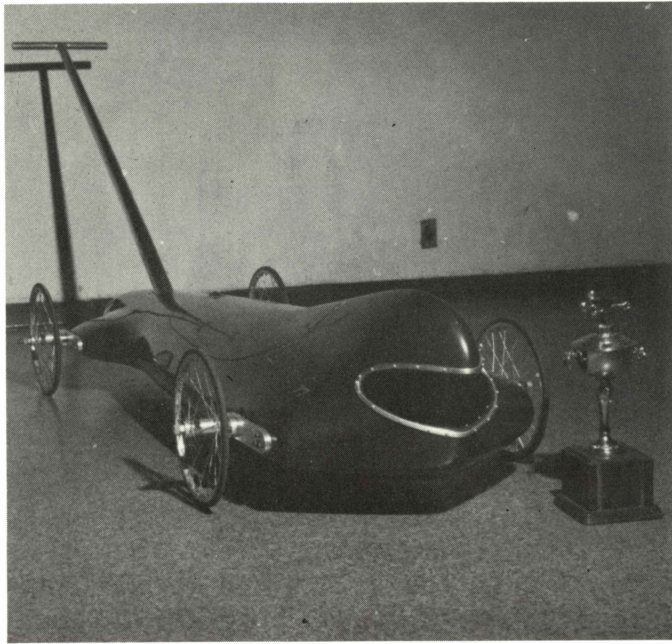
The present A buggy was built just prior to the 1964 race. It is about 6 feet long and rides on soap box derby wheels. A very light plastic sheet body covers the tubular aluminum frame. Steering is accomplished by a unique direct linkage system. The driver, who lies in a prone position, is protected from shocks by a foam rubber pad.

Among several innovations this year is the possibility of unique costuming for the push team.

This year's co-chairmen are David Shaffer and Barry Newberger. With veteran driver Dave Snyder and several of last year's excellent push team back and new contenders for these positions, the dorms are in excellent shape to take one of the winners' trophies.

2 buggies entered.

- A: *length - 72''*
 height - 18''
 wheels, number and type - 4 soap-box derby
 wheels
 suspension - none
 frame - tubular aluminum frame
 brakes - caliper
 body - sheet plastic
 driver position - prone
- B: *length - 72''*
 height - 18''
 weight - 80 lb.
 wheels, number and type - 4 wheels type
 unknown
 suspension - none
 frame - aluminum tubing
 brakes - caliper
 body - shell enclosing driver and front
 wheels
 driver position - prone



Phi Kappa Theta

Phi Kappa Theta's two veteran buggies, "Snorpus" and "Shamrock," will appear again in the Sweepstakes races.

A four year veteran, "Snorpus" will be out to capture a prize which has eluded her in the past - a sweepstakes trophy. Although she has won design trophies in 1963 and 1964, "Snorpus" has never run fast enough on race day to bring home a cup. Driven by Jim Hardt and prepared by a team headed by Larry Moran and Ray LeClair, "Snorpus" should be a buggy to watch this year. "Snorpus" has a fiberglass unibody and independent torsion bar suspension. "Snorpus" also has had severe alignment problems and bad luck. Accidents the week before the race hurt her chances in 1965 and 1966. This year with a little luck and hard work by her team, "Snorpus" should be in the winners' circle.

The most successful buggy at Phi Kap is the three-year old "Shamrock." On her maiden voyage in 1964, "Shamrock" won second place design and shared third place Sweepstakes. "Shamrock" was built on the theory that simplicity and lightness were qualities a good buggy should possess. With the re-

moval of the fins which were added two years ago, and rebuilding of the rear suspension, "Shamrock" will again fit the description her designers had in mind when she was built. Her features include unibody construction and a plexiglass dome. Piloted by a new driver, Bob Arias, and prepared by a crew captained by Ed Hunia and Carl Spitz, "Shamrock" should again bring credit to Phi Kappa Theta.

2 buggies entered.

*Snorpus: length - 78"
height - 24"
wheels, number and type - 4 wire wheels
suspension - independent torsion bar
frame - none
body - fiberglass unibody
driver position - prone*

*Shamrock: length - 80"
height - 18"
wheels, number and type - 4 soap-box
derby wheels
frame - none
body - fiberglass unibody
driver position - prone*

Kappa Sigma

Kappa Sigma will enter the 1967 Buggy Sweepstakes with a new and unique buggy, after many years of absence. The buggy's design was conceived last summer and initial work begun during last semester. The experience gained from last year's buggy, which suffered a serious accident the week before the race, led the designer to abandon the usual four wheel design in favor of a three wheeled buggy.

The new buggy is unique among the three wheelers in that the driver lies on his back. This position was selected through air-friction studies and the added safety afforded the driver. With a height of 18 inches and a weight of only 60 pounds, Kappa Sig's entry will be one of the lightest and sleekest in this year's race. Other features of the buggy are an aluminum box frame, giving the buggy a total length of eight feet, and a fiberglass shell. The shell, coupled with the unique coil spring suspension, gives the buggy a bullet-shaped silhouette.

Pi Kappa Alpha holds the distinction of being one of only three houses to officially break the 2:30.0 barrier. Last year the "Shark" finished with the fastest third place time ever, 2:30.5, after running a qualifying time of 2:29.4.

The "Shark's" younger brother, the "Tiger Shark," has also proved a potent performer, finishing seventh last year and sixth the year previous.

PiKA has pioneered in fiberglass molding with the "Cheetah" in 1949, and in prone driving with the original "Shark" in 1953. Both innovations are incorporated in the present buggies. The unique shape suggested by the name "Shark" has excellent laminar flow characteristics combined with essentially unrestricted driver visibility. The "Tiger Shark," and, to a lesser extent, the "Shark," are undergoing modification by a crew headed by Buggy Chairman C. Oliver Bounds.

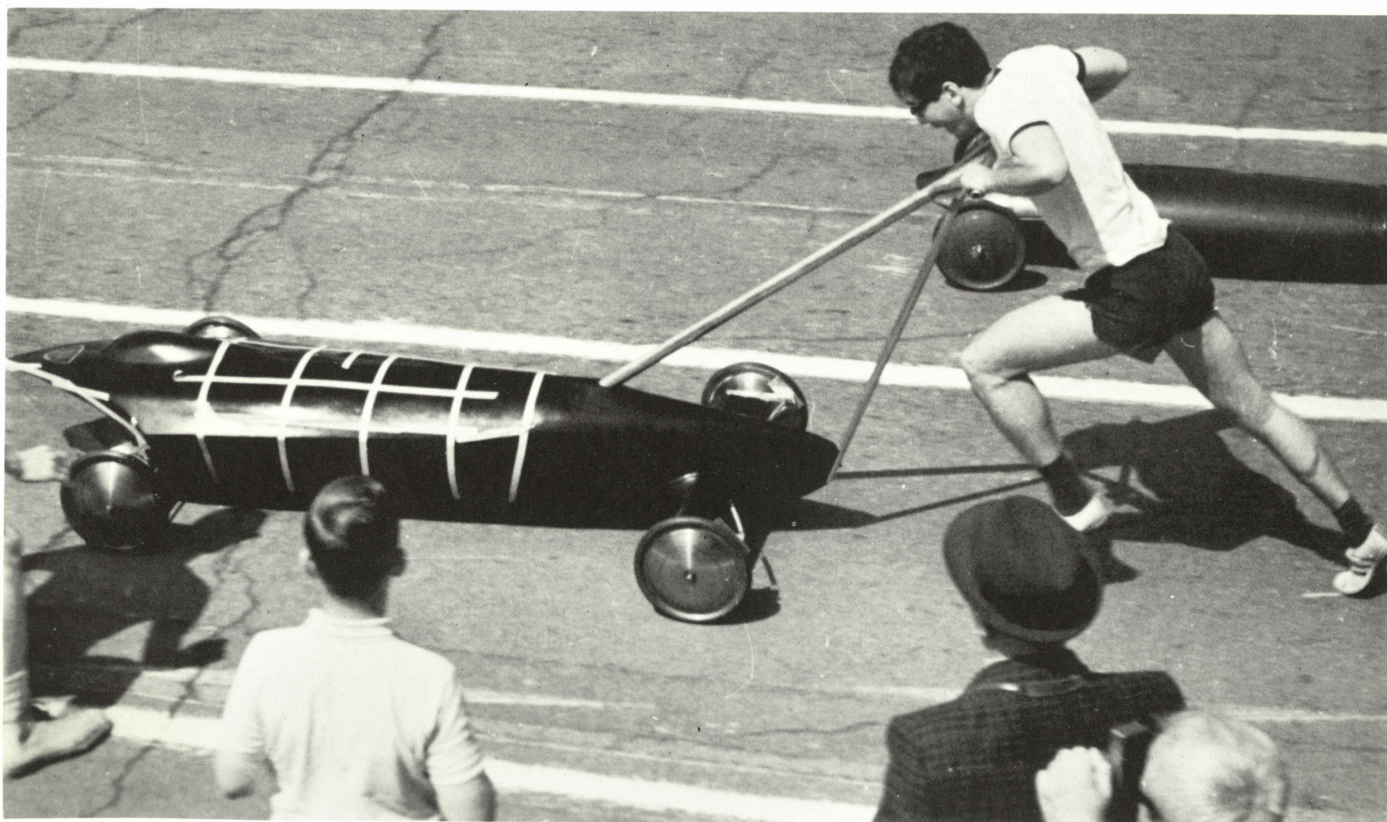
Probably PiKA's greatest strength this year lies in its push team. The return of veteran pushers Tim MacMillan, Dennis Cash, Dave Simons, Ben Brown, and Jim Probala ought to form the nucleus of a stronger, faster, and more experienced push team. The return of veteran drivers Rich Sharkey and Hank Krokosky should also be a valuable asset.

Pi Kappa Alpha

2 buggies entered.

Shark: length - 75"
height - 22"
weight - 120 lb.
wheels, number and type - 4 soap-box
derby wheels
suspension - leaf spring
brakes - caliper
body - molded fiberglass
driver position - prone

*Tiger
Shark:* length - 72"
height - 18"
weight - 120 lb.
wheels, number and type - 4 soap-box
derby wheels
frame - aluminum reinforced fiberglass
brakes - caliper
body - molded fiberglass





Although radical in its design, the SAE buggy has been a formidable opponent for its four wheel competitors. SAE's "Maroon," designed by Bill Faircloth, takes advantage of bicycle aerodynamics as well as the abilities of an energetic push team.

The SAE buggy, with its superlight construction, gives the pushers a special advantage on the hills. The "Maroon" has extra light spoked wheels, high pressure pneumatic tires, and a racing bike steering system. The driver lies flat on the main supporting bar of the buggy with his chest supported on a moulded fiberglass shell. The driver wears leotards to minimize air resistance and a moulded, heavy duty plastic helmet for head protection. He has excellent maneuverability, unimpeded visibility, and braking power through its conventional caliper hand brake.

The "Maroon" has undergone extensive modification for '67. SAE anticipates that these changes will insure a successful race.

The second buggy, "Red," was brought out of storage in 1966 for the first time in several years and since then has been revamped.

Push teams use a "spurt" pushing system - each runner pushing the buggy forward and then running to catch up to push again. The result is maximum push and maximum speed, the fastest race time being 2:30.5. Last year hampered by a fork that collapsed on the second day of racing the "Maroon" had a disappointing finish, however, this year both buggies are in prime shape and awaiting race day.

Sigma Alpha Epsilon

2 buggies entered.

- Maroon:* length - 66"
height - 36"
weight - very light
wheels, number and type - 2 racing bike
wire wheels
suspension - none
frame - aluminum alloy, modified bike
type
brakes - caliper
body - none (fiberglass pan to support
driver)
driver position - prone
- Red:* length - 84"
height - 42"
weight - very light
wheels, number and type - 2 racing bike
wire wheels
suspension - none
frame - aluminum alloy, modified bike type
brakes - caliper
body - none (fiberglass pan to support
driver)
driver position - prone

Many of the familiar innovations of the "Lizard" are unchanged. Its slim, low-slung lines, rearward driver position, chromed radius arms, and large wire wheels result in a strong resemblance to the Lotus of formula racing fame. A pre-stressed aluminum skin, external shock absorbers all around, and racing-inspired front and rear suspension complete the picture of a thoroughbred racing machine.

The big news at Sigma Nu this year, however, is the appearance of a totally new buggy. Details are still scarce, but radical new techniques and materials will allow the new machine to be considerably less than half the weight of the "Lizard."

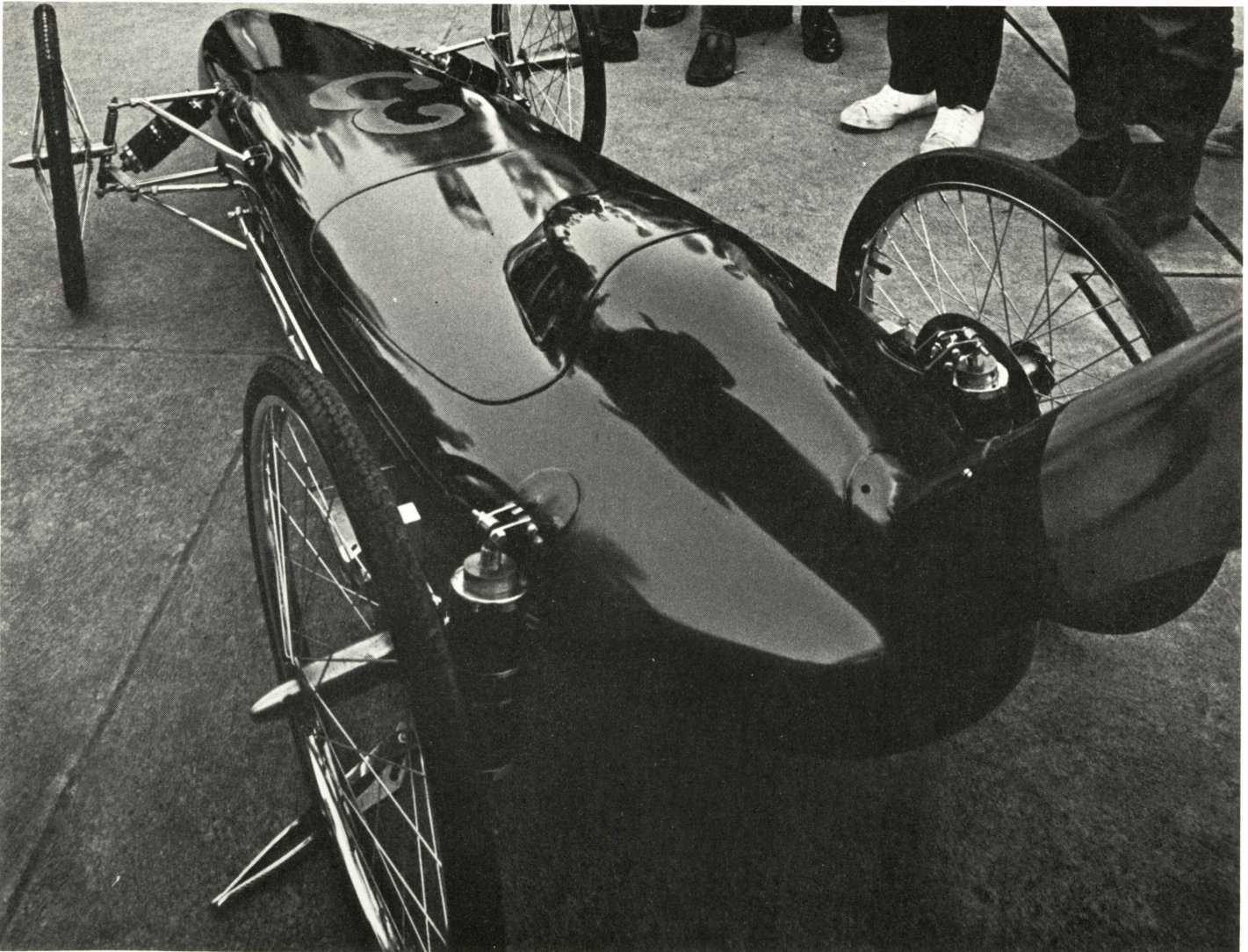
With a stronger-than-ever push team, under the direction of Wilden Woolley, working in close conjunction with Bob Summerfeldt's design and construction crew, Sigma Nu is rightfully optimistic towards adding

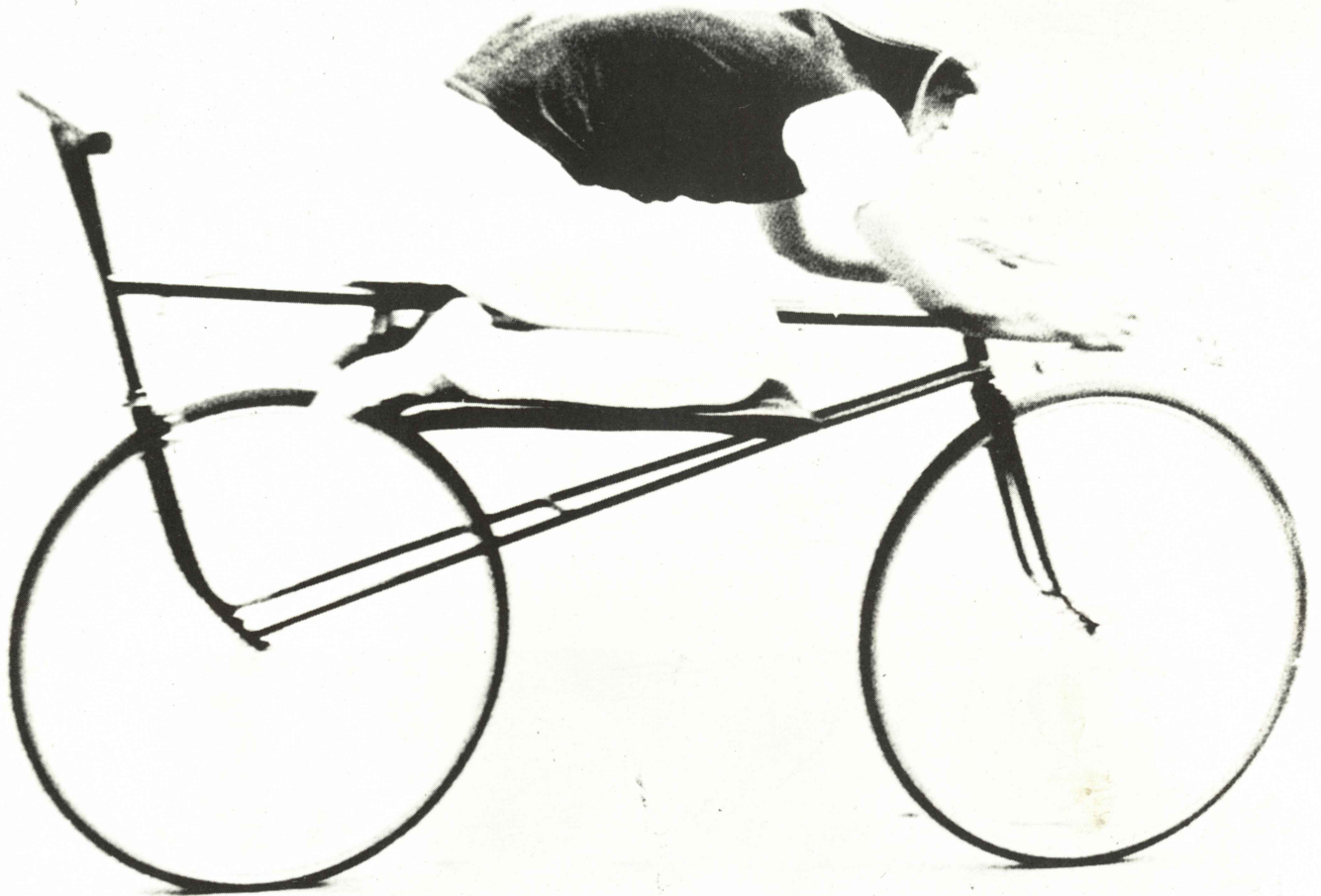
a Sweepstakes trophy to last year's award for excellence in design. With two capable, race-ready buggies, "Team Zoo" should be a leading contender on race day.

2 buggies entered

*Lizard: wheels, number and type - 4 large diameter wire wheels
suspension - air single action shock absorbers
frame - aluminum tubular space-frame
brakes - disc brakes
body - pre-stressed aluminum
driver position - lying on back*

Sigma Nu





Tau Delta Phi

Once again Tau Delta Phi is entering two buggies of bicycle design. Bicycles have been chosen over the conventional buggy because of the cornering ability and relative lightness inherent in the design. The "White Scorpion," made of tubular aluminum, proved to be the lightest entry in last year's competition at 15 pounds. The steel "Black Widow" was also a very light 30 pounds.

Last year, the "White Scorpion" proved to be deadly as it finished fourth in its first year out. The buggy was built one week before the competition and was experimental until the day of the consolation race when she finished with the unofficial second fastest time of the two day event. The "Black Widow" continued to be unlucky as she was first run off the course by a stray car and later was disqualified for the second year in a row. Both buggies, designed and built by chairman Mike Pollack, feature racing bicycle parts, including caliper hand brakes, and specially designed racing wheels. The drivers are perched on padded supports in a jockey position to increase maneuverability and provide a wide field of visibility.

This year with stronger push teams, two proven buggies, added streamlining, and perhaps a new name and paint job for the "Widow," Tau Delta Phi should have its best team since 1959 when a four wheel buggy collapsed, injuring the driver.

Theta Xi

Theta Xi will enter the same buggies this year as they did last, however there have been a number of engineering advances and a reversal of position. It is expected that the new A buggy, with its excellent maneuverability, will perform even better than last year.

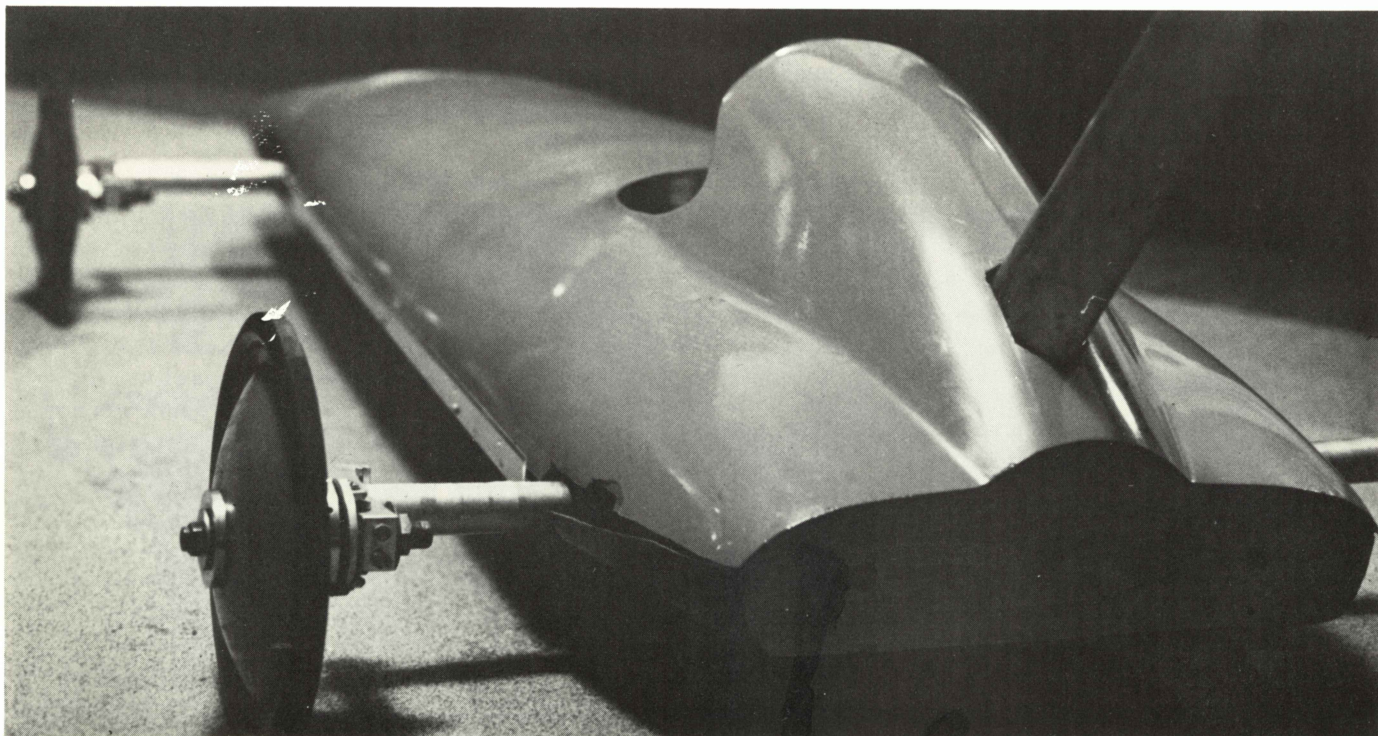
In 1964 the A buggy was built by a pledge M.E. who had studied the races and designs for a number of years. It raced for the first time in 1966. The suspension is still classified. The body is plywood covered with fiberglass painted dark blue. The driver enters through a hatch in the top and lies on his chest to drive. The brake is a rubberband loaded friction device. With the first push team this buggy should do very well in the sweepstakes.

π , the B buggy this year, was built in 1959 and first run in 1961. Both its free roll time and cornering ability are good. It is one of the few surviving buggies where the driver lies on his back. π is equipped with a torsion bar suspension system and caliper brakes. A molded fiberglass shell clamps together to cover the aluminum tube frame. It will race in red again this year.

Rodney McDowell, Mark Begeman, and David Harris and several other B-team pushers will be competing for the first team. TX's large, enthusiastic pledge class will augment their numbers. Bill Segal is expecting strong competition for one of the two coveted driver spots.

2 buggies entered.

- A: length - 84"
height 18"
weight - 75 lb.
wheels, number and type - 4 soap-box derby wheels
suspension - classified
brakes - rubberband friction device
body - plywood covered with fiberglass
driver position - prone
- π : length - 108"
weight - 100 lb.
wheels, number and type - 4 soap-box derby wheels
suspension - torsion bar
frame - aluminum tubing
brakes - disc
body - molded fiberglass shell in 2 halves, which clamp together over driver
driver position - lying on back



Evolving Buggy Designs

Larry Moran

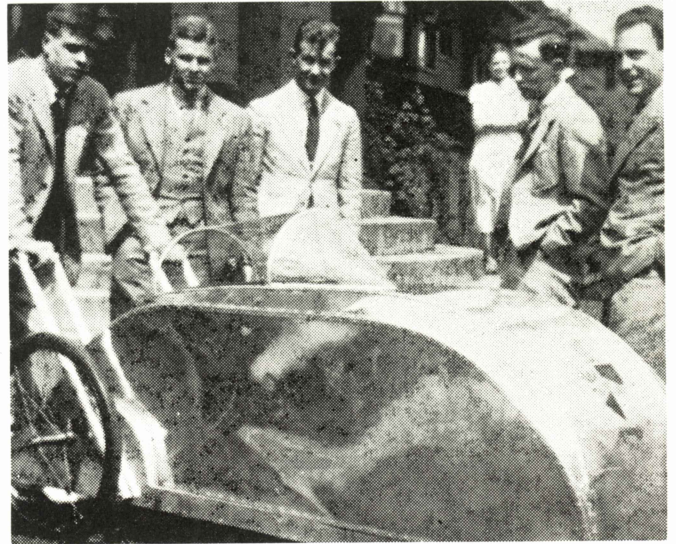
Organizations here at Tech have built and raced pushmobiles or buggies since 1920. The change in the designs of these machines has been as great as you might expect. The sleek, beautiful buggies of today bear little resemblance to the freak designs of 1920.

The earliest buggies were designed by students who were influenced by the automobile. The buggies resembled the Indianapolis racers of the period. Only the scale was substantially different.

Each machine was designed to contain two men, a mechanic and a driver. The mechanic was the prime source of power for those early buggies, riding on the free roll portion of the course. He also assisted at the mandatory pit stop and could change places with the driver as long as both of them did not touch the ground at the same time.

Buggies were required to have four wheels and to weigh at least seventy-five pounds.

The buggies which raced for the Sweepstakes trophy were blunt-nosed boxy machines, while the design trophy winners were freaks. A monstrous fish entered by DU won the cup in 1921. The fish was followed by a grasshopper. Design rules were changed in 1925 to require that the same body be raced as entered for design. Thus the colorful freaks were eliminated.



The buggy of the period sported a soap box type body. The driver position was upright and the steering wheel was linked to the solid axles via cables. The tires were of the large balloon type. The pushbar consisted of two wooden poles which protruded at an angle from the rear of the machine. No brakes were required, and none of the racers were equipped with them.

In 1925 the DTD design winner was described by the Tartan as : "A beautiful yellow car trimmed in brown." The radiator was highly polished nickel and the body shaped gracefully to a fin-like projection in the back. In 1927, Phi Kappa Psi entered "a remarkable copy of the great racer used by Major Seagrave in breaking the world's speed record some weeks ago."

In the late 20's and into the 30's the automobile continued to be the major model for the design of buggies. By 1937, three wheeled buggies had been introduced. The bodies were smoother and slimmer. Tires, suspensions and steering remained much as they had been fifteen years earlier. A buggy entered by Beta had a driver in the prone position. In 1937 ATO entered "a quaint conglomeration of wood, galvanized iron pipe, leather upholstery and aluminum covering."

During the 30's a rule was introduced requiring each buggy which entered the design judging to run in the race. The second man in the buggy was slowly eliminated and by 1940 few buggies carried the hill two pusher during free roll.

In 1938 Pika was influenced by the airplane. In that year they entered a machine which was twelve

feet long and consisted of a light steel tubing frame which supported an aluminum framework. Airplane silk covering formed the exterior of the buggy. The driver rode in the prone position and looked through a window of cyralin, a transparent material. The machine weighed 110 pounds.

A major change in the design of pushmobiles occurred in the late 40's. No races were held during the war and most buggies and experienced buggy workers were gone from the Tech campus. This lack of trained talent and old buggies necessitated the building of new and different buggies.

Wedge shaped bodies mounted on four derby wheels were the common style. Several racers carried their drivers in the prone position although most teams preferred a crouched, sitting position.

Buggies reached their present day form in the mid-50's. Phi Kap introduced the first fiberglass uni-body. ATO brought out the "Golden Goose" an extremely heavy, low to the ground buggy.

In 1961, a controversial design was entered by SAE. Since the design rule which required a machine to have four wheels had been eliminated years before, the "bike" entered Sweepstakes competition. These bikes were basically racer type bicycles modified to permit the driver to ride in a prone or crouched position. Although the detractors criticize the bike as being a bicycle and not a buggy, the bikes have compiled a good record in the past six years.

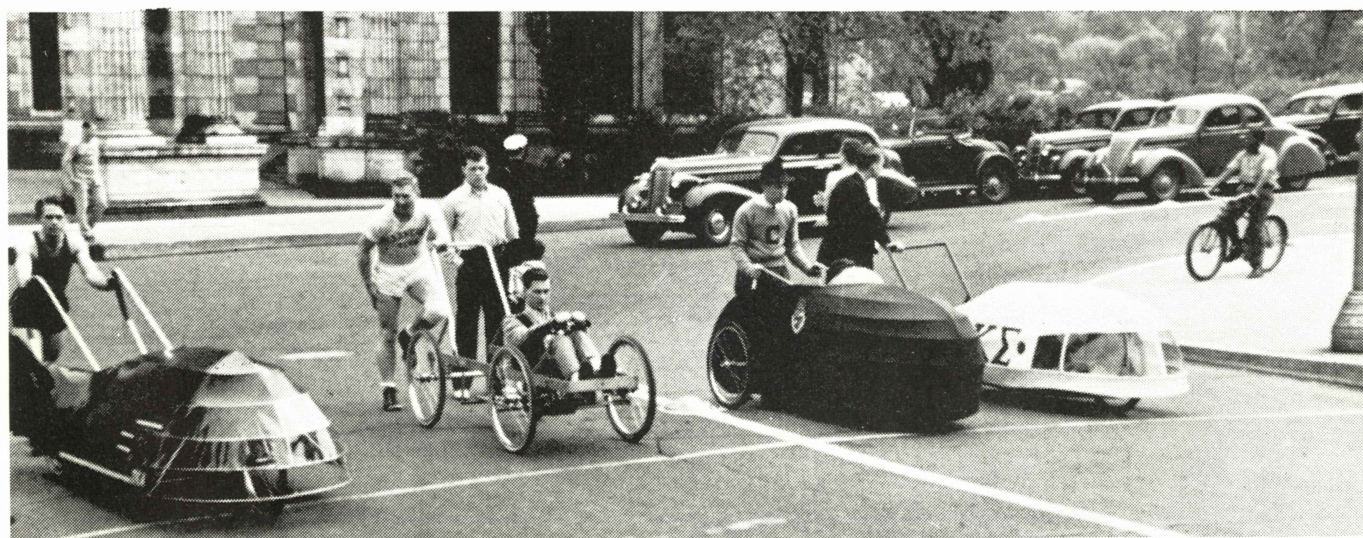
The influence of the automobile is not dead in the design of buggies. Just as the sports cars of the 20's impressed builders of that era, so today's sports cars influence present day designers. Sigma Nu has

created a buggy which is patterned after a Lotus racer.

Design has changed in the last forty years of racing. The buggies now are all designed to run faster through streamlining. Fiberglass is the most popular building material. Brakes have become mandatory on all machines entering the race. Several buggies sport airbrakes or disc brakes, while bicycle style caliper brakes are in evidence on many buggies. Pushbars now stand free and the driver can assume many positions. He is now under the axles, on his back, on his stomach or sitting.

All of these changes are readily evident to the casual observer of the Tech creations. Not evident are the many changes on the interior of the buggy. In the past the buggy was open, had simple steering systems and little or no suspensions. Today the buggy interior is a complicated and secret place. Each buggy chairman has a few secrets which he is sure will allow him to defeat his opponents if only his pushers come through.

The philosophy behind the design of buggies has changed also. In the first years of the competition the design winners did not even have to compete in the race, and if they did they did they could change the bodies before the actual race. In the succeeding years in order, to be eligible for design trophy, a buggy had to at least compete in the Sweepstakes. The feeling now is that a buggy should be designed primarily for speed and safety. A buggy now must now only race in exactly the same form in which it is judged, but must finish in the top half of the field on race day. The design winners of today's beautiful and efficient machine are totally different from the fish and grasshopper of the 1920's.



Sweepstakes Outlook 1967

Dennis McEvoy
Dave Kamons

Forecasting this year's Sweepstakes is an even greater problem than usual because of the large number of new buggies from the regular competitors and the return of two veterans. ATO is hatching an improved version of the "Golden Goose," which promises to be a strong contender. Information on this creation is scarce, but the ATO's may be shooting for a new course record. SN has a radically new buggy under wraps. Unconfirmed reports of fast free rolls and hopes for fast hills have been drifting across Morewood Place from the Aoo. Beta Sig has been working on a new buggy which they think can beat the ill-fated "Dolphin," but unfortunately they are not going to run it this year. This year will welcome DU back to serious competition. They have replaced their flying door with an impressive new buggy. Although it appears to be one of the heavier buggies in the race, it shows definite potential and may prove to be a big surprise on race day. Kappa Sigma is returning after a long absence, despite a near tragic accident which scratched them last year. They seized the radical three-wheel design that has shown record performances on the free roll.

All last year's favorites will be returning. Tau Delt and SAE will field the bikes that did so well last year. The two wheelers turn in near record times on the uphill portions of the course and manage to hold their own against their streamlined competitors on the free roll. The Dolphin will be going for a record free roll, if it stays under control; BSR is promising a dazzling performance. PiKA will be entering its fish. They say that their Shark actually knows the difference between mere practice and a race for the money. It travels the course on race day as if it had a mind of its own (and a good one, too).

The Betas are returning with last year's winners and their push teams almost intact. They're the ones to beat and are going to be under pressure all the way. The "Goose" and the "Lizard" will be out of the menagerie for Carnival. The "Goose," with all its rumored machinery, will be fighting for a first place. The "Lizard" is supposed to be in the best form ever. The Phi Kaps have been practicing hard during the pre-season Sunday morning parades, and will doubtless be aiming for a race trophy to keep their design trophy company. Of course these predictions are half guesswork and the other half luck, but after much consideration and several sessions with our famed dart board, we rank them like this.

In the Championship heat and with good chances for first, is Beta Theta Pi's "00." This is a tested, prizewinning design powered by a championship push team. With Steve Peck back for another year, they have an experienced driver who turned in a sterling performance as a rookie. Fred Riedel's crew will probably turn in a time very close to last year's 2:28 in a hot race.

The mysterious "Goose" should make the Championship heat, too. Its times have been improving over the past two years. If it follows the pattern, it should be a sure contender. Buzzy Walker is not letting information leak out about his machine, and no ATO will say anything more positive than, "Wait and see." This is just what we'll have to do while the "Joy-Boys'" big psych takes over.

PiKA's sharks will have to do a lot of fast swimming to maintain their supremacy this year. We hope that the accidents we've seen during practice aren't the result of a big jinx that has hit this house. We say that the psychic "Shark" will be up at the top, unless it's been hit by the "whammy." If the "Shark" and the "Goose" race "oo" in the Big Heat, we predict less than a two second spread between first and third.

Beta's B Buggy seems a safe choice to be among the top half-dozen. In '65 it took third behind its big brother. Last year it ran the consolation heat. With Stu Berni returning this year, and an experienced push team to back it, "000" will be no surprise at the top.

The bikes are going to pose an even bigger threat to the squat pushmobiles this year. Bob Rosen's TDP team is supposed to be turning record times on hill one, even before it gets into racing trim. While the bikes present less of an opportunity

for fancy styling, they still require a fair amount of tuning and adjustment. The "Dwarf" and the "Widow" are reputed to be in top shape for the free roll. Barring another series of accidents and heavy traffic on the course (somebody's mother coming home from Oakland, no doubt), Tau Delt should turn in another record time and may even take home a trophy for the first time since the bikes began running.

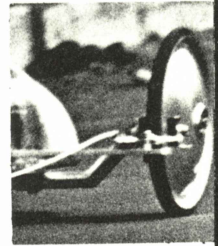
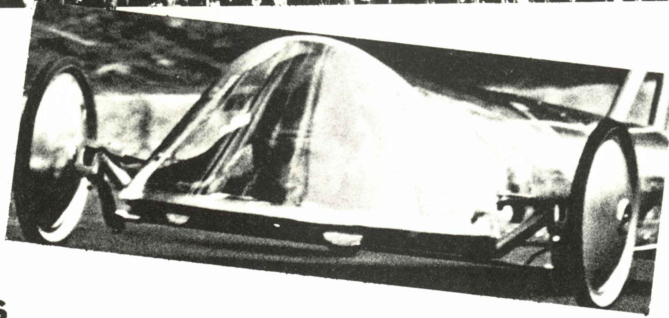
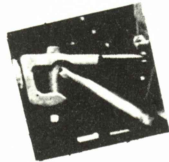
SAE can't be slighted in this department either. While running a bit slower than the other bikes, they did make the consolation heat last year and could possibly do even better this year. We remember nearly being run down while snowshoeing past Skibo by an SAE bike (with carbide-stud tires for the icy spots). We doubt that the bikes will be running in conditions quite that bad, we feel sure that winter practice could be decisive when they start dodging Frew St. potholes.

Of the other contenders, Beta Sig stands the best chance of an upset, if they can put a strong push team behind their amazing free roll. They will have a number of pledges pushing and may upset the established winners of the past several years. Phi Kap's fiberglass will be back, but where they will finish is purely a guess. The Deltas will be fielding much of their push team from last year, most of whom were rookies then. With a little experience under their belts they may surprise a number of people. TX has been practicing hard for the race this year. The Dorms seem pretty well out of contention. Their former A

buggy has been running very poorly in practice and will most likely be scratched.

The general outlook is only somewhat clearer than Monongahela River water. Sunday practices have brought a number of house secrets to light, which may show up in closer times this year than ever before. Perhaps one could do a better job of forecasting by putting all the buggy names into a hat and pulling them out blindfolded. We think we have looked under one corner of the blindfold, but only the Sweepstakes itself can vindicate or condemn our pronouncements.





**mens dorms
carnival 67**

ROMAN

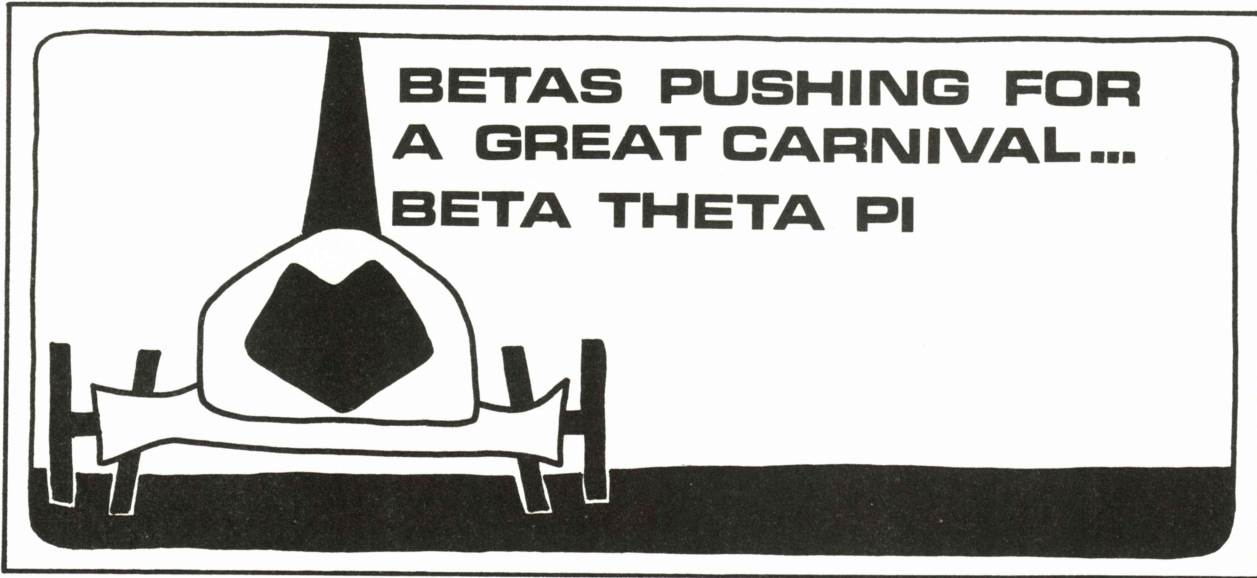
**last year the free roll...
this year the course!**



BETA SIG

**HAPPY
CARNIVAL,**





The 1967 Sweepstakes Committee sincerely thanks the Schenley Park and Pittsburgh Police and especially Sgt. Short and Chief Gus Crop for their much needed assistance and co-operation.

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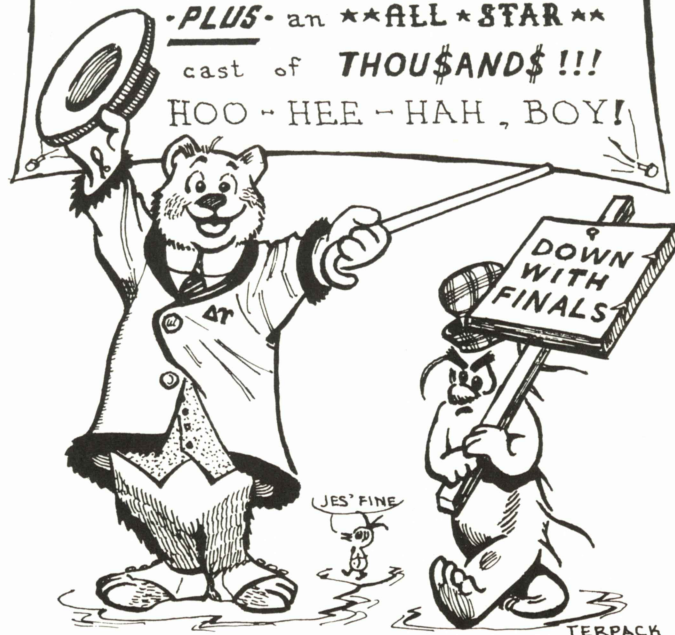
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A PZAZZ WEEKEND, WITH
 → ZAP BOOTHS, ZORCHY
 BUGGY RACES, ZONK UMOC,
 ZOOM PLANK - JOUSTING,

-PLUS- an **★★ALL★STAR★★**
 cast of **THOUSANDS!!!**

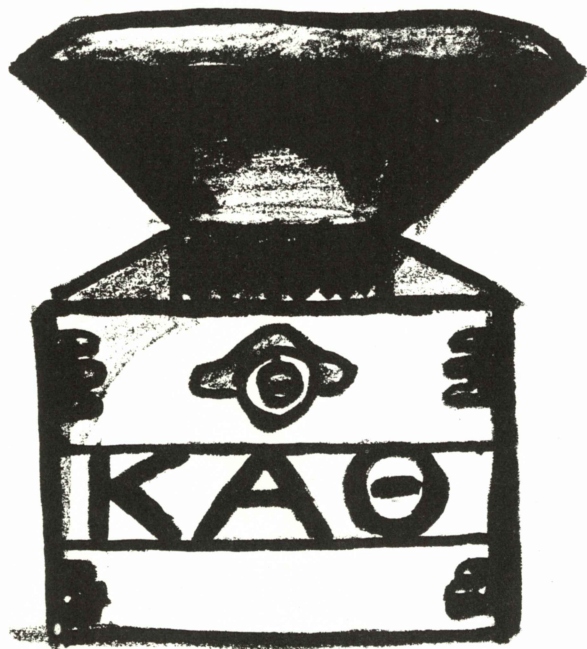
HOO - HEE - HAH, BOY!



HAPPY SPRING CARNIVAL



Pandora says
"give in"



... let yourself go...
SPRING CARNIVAL!

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Building A Buggy Made Simple

Jacqui Pratt
Barry Rabkin

Considering the caliber of people this article is directed to, the authors felt that the best approach would be to provide a manual of simple procedures for building a buggy. First, let us direct our attention to the three main branches of people this article will reach: men and women in E&S (they may skip to the next paragraph), Maggie Murph women (this article provides an opportunity for them to bone up on their reading abilities), and Fine Arts people (who may now go on to the end). Let us now proceed to the techniques of building a buggy.

As any good buggy builder knows, one of the basic necessities for making a buggy which will run is wheels. (All of those who thought it was someone crazy enough to be a driver loses one buggy point.) Wheels should be round and have rubber coatings around them. There should be four--one for each corner. (Bikes are naughty, a no-no for the *real* buggy enthusiast.) If one carries an extra wheel in case of blow out, the driver has to be quick enough to exchange the spare tire for the bad one while the buggy is in motion. The spare must be kept underneath the buggy, next to the fifth of whiskey (used to keep the driver's spirits up). Let us for simplicity call each wheel W1, W2, W3, W4 or better yet, LF, LR, RF, RR. (We will leave it to the E&S students scattered about the campus to explain this designation of the wheels to the rest of the campus.) Hint: LF means Left Front. (Aren't you glad this hint does more for you than the hints for science problems by professors?) Before the race, the wheels should be heated--preferably not overheated or else the rubber will tend to melt, and not only will the speed of the buggy be hindered, but also there will be a tendency for the wheels to stick to the road, the pusher, and nearby watchers. (A bonus buggy point is received for gumming up a rent-a-cop.)

A good thing to have besides the wheels is a body, and although all the males want it to be female, the buggy bodies are made of a framework surrounded by a shell shaped out of aluminum or chicken wire. In the final selection of material, the deciding factors are: 1) how adventurous the driver is, and 2) how cheap the organization building the buggy is.

The shape of the buggy is an important consideration. A good buggy, if one is considering only wind resistance factors, should be shaped similar to an infinitely straight line. However, since this shape would take a little time to build and takes corners poorly, other designs must be considered. Consider the shape of an ellipse. (Are you considering it?) This shape is aerodynamically inefficient, but excellent if one has to contend with the problem of a fat driver. One could also make it square, but this really isn't a soap box derby.

Another consideration for the conscientious buggy builder is the push-bar. It is best to have it sturdy in construction and well attached to the buggy so that the buggy doesn't end up in an unscheduled free roll, carrying tin cans, empty bottles, stray dogs, and loose rent-a-cops down the hill with it. There is also the possibility that the pusher might damage the excellent, glass-smooth streets which make up the course. Tech simply couldn't afford street repair bills without raising the costs of the women's dorms.

One must also consider the window that the driver uses to look out of while driving. (Of course, if you wish to reduce the size of a group by one, you can save money and not put the window in.) The window may be placed anywhere, but it is best positioned so that the driver can see where he is going. The usual driver position is lying on one's stomach, looking ahead, but a few stalwarts have the driver positioned on his back looking forward out of a bubble top. Windshield wipers would be useful, but races are not run in the rain.

Now all essential components have been discussed. In summation: the wheels are attached to the axle which is attached to the buggy body which surrounds the driver. The push-bar is attached to the axle and to the pusher, although the push-bar and pusher are generally never permanently attached. The deletion of the subject of "brakes" is intentional, since they never work. We advise leaving them out.

The authors' hopes have been to provide some helpful hints to prospective buggy builders. See you at the heats. We are usually the buggy at the rear.

Officials

DESIGN : Milton Shaw
STARTER: John Trezise
HEAD JUDGE: Major Lee Cose
FINISH: 1. Eugene Boyer
2. Dr. David Gall
3. Col. William S. Crocker
4. Dr. Robert M. Morgan
5. Dr. C.D. Mote
PUSH ZONE: 1. Capt. James J. Steinbach
2. Dr. Alan Strehler
3. Chief Gus Crop (Park Police)
COURSE: 1. Dr. Loren Hepler
2. Dr. John Del Bene
3. Dr. Charles G. Culver

FOLLOW CAR: Dr. Hugh D. Young
SWEEPSTAKES COMMITTEE:
CHAIRMAN: Mike Smolens
DESIGN: Pete Heinkel
SECRETARY: Jaimee Edlan
CARNIVAL CHAIRMAN: Steve Baker

Any recognized organization of Carnegie Tech undergraduates may enter no more than two teams. Each team consists of one buggy, one driver, and five pushers. The driver and pushers of each team may only participate with the buggy in their team.

Safety:

In order to participate in the sweepstakes, each buggy must pass a safety inspection where it must demonstrate:

1. adequate vision ahead and 45 degrees to each side.
2. adequate braking system.
3. nuts involved in the control of the buggy must be fastened with lockwashers or locknuts.

Construction:

1. The length of the buggy may not exceed 15 feet and the width may not exceed 5 feet.
2. No internal propulsion of the buggy by steam, gasoline, oil, electricity, jet, liquid air, or any other mechanical means will be permitted.

Contest Rules:

1. The Friday Preliminary race shall be run in heats of three buggies each. No two buggies from the same organization may race in the same heat.
2. The race shall be run over the course shown on the map.
3. Each pusher may touch the buggy only in his push zone (see map for zone) and the adjacent neutral zones. The last pusher must have his hands on the buggy when it crosses the finish line.
4. No individual may enter the street to pace a buggy pusher at any time.
5. The combined weight of each buggy and driver must be constant. Jettisoning of weight is prohibited.
6. The time between the start of each heat will be ten minutes with warnings given at 5, 2, and 1 minute until the start of each heat. Any extension of this time interval must be requested before the 2-minute warning.

7. The three buggies with the shortest preliminary times will race together in the finals on Saturday; their order of finish in the race will determine the first three places. The three buggies with the next shortest preliminary times will race in the consolation race on Saturday; their order of finish will determine the 4, 5, and 6 places. This arrangement is used to prevent any possibility of mechanical timing errors in determining the winner.
8. Any buggy that has a design failure or that deliberately collides with or cuts off another entry will be disqualified.
9. Any buggy that complies, in the judges opinion, with the rules and is involved in an accident or slows or stops to avoid an accident will be eligible for a rerace. The rerace will be granted if the buggy is immediately impounded and passes, except for accident damage, a safety inspection.
10. The judges may disqualify any entry for going outside his assigned lane.

Inclement weather:

1. The judges may cancel the race due to inclement weather or insufficient course protection.
2. If the finals are cancelled, the winner will be decided on the basis of preliminary times.



Sweepstakes Heats

Preliminaries

LANE:	HEAT 1	
1	Sigma Nu	_____
2	Delta Upsilon	_____
3	Alpha Tau Omega	_____
	HEAT 2	
1	Dorms	_____
2	_____	_____
3	Pi Kappa Alpha	_____
	HEAT 3	
1	Delta Tau Delta	_____
2	Phi Kappa Theta	_____
3	Theta Xi	_____
	HEAT 4	
1	Beta Theta Pi	_____
2	Sigma Alpha Epsilon	_____
3	Kappa Sigma	_____

LANE:	HEAT 5	
1	Phi Kappa Theta	_____
2	Dorms	_____
3	Tau Delta Phi	_____
	HEAT 6	
1	Beta Sigma Rho	_____
2	Delta Tau Delta	_____
3	Theta Xi	_____
	HEAT 7	
1	Sigma Alpha Epsilon	_____
2	Sigma Nu	_____
3	Alpha Tau Omega	_____
	HEAT 8	
1	Beta Theta Pi	_____
2	Pi Kappa Alpha	_____
3	Tau Delta Phi	_____

Finals

CONSOLATION HEAT

_____	_____
_____	_____
_____	_____

CHAMPIONSHIP HEAT

_____	_____
_____	_____
_____	_____

